



Claims as amended (no markings)



In the Claims

1. A charge detection device for use in an image sensor, said charge detection device including a vertical punch-through transistor having the gate surrounding the source and being conductively connected to the source.
2. The device according to claim 1, wherein a charge present under the gate modulates the punch through potential barrier of the vertical punch-through transistor.
3. The device according to claim 2, including a charge reset means adjacent to and coupled to the vertical punch-through transistor to remove charge therefrom.
4. (Cancelled)
5. (Cancelled)
6. (Cancelled)
7. A CMOS device comprising:  
an image sensor; and  
a charge detection device in said image sensor including a vertical punch-through transistor having the gate surrounding the source and being conductively connected to the source.

8. The device according to claim 7, wherein a charge present under the gate modulates the punch through potential barrier of the vertical punch-through transistor.

9. The device according to claim 8, including a charge punch-through transistor to remove charge therefrom.

10. The device according to claim 9, wherein the charge reset means is an MOS reset gate.

11. (Cancelled)

12. (Cancelled)

13. A CCD device comprising:

an image sensor; and

a charge detection device in said image sensor including a vertical punch-through transistor having the gate surrounding the source and being conductively connected to the source.

14. The device according to claim 13, wherein a charge present under the gate modulates the punch through potential barrier of the vertical punch-through transistor.

15. The device according to claim 14, including a charge reset means adjacent to and coupled to the vertical punch-through transistor to remove charge therefrom.

16. The device according to claim 15, wherein the charge reset means is an MOS reset gate.